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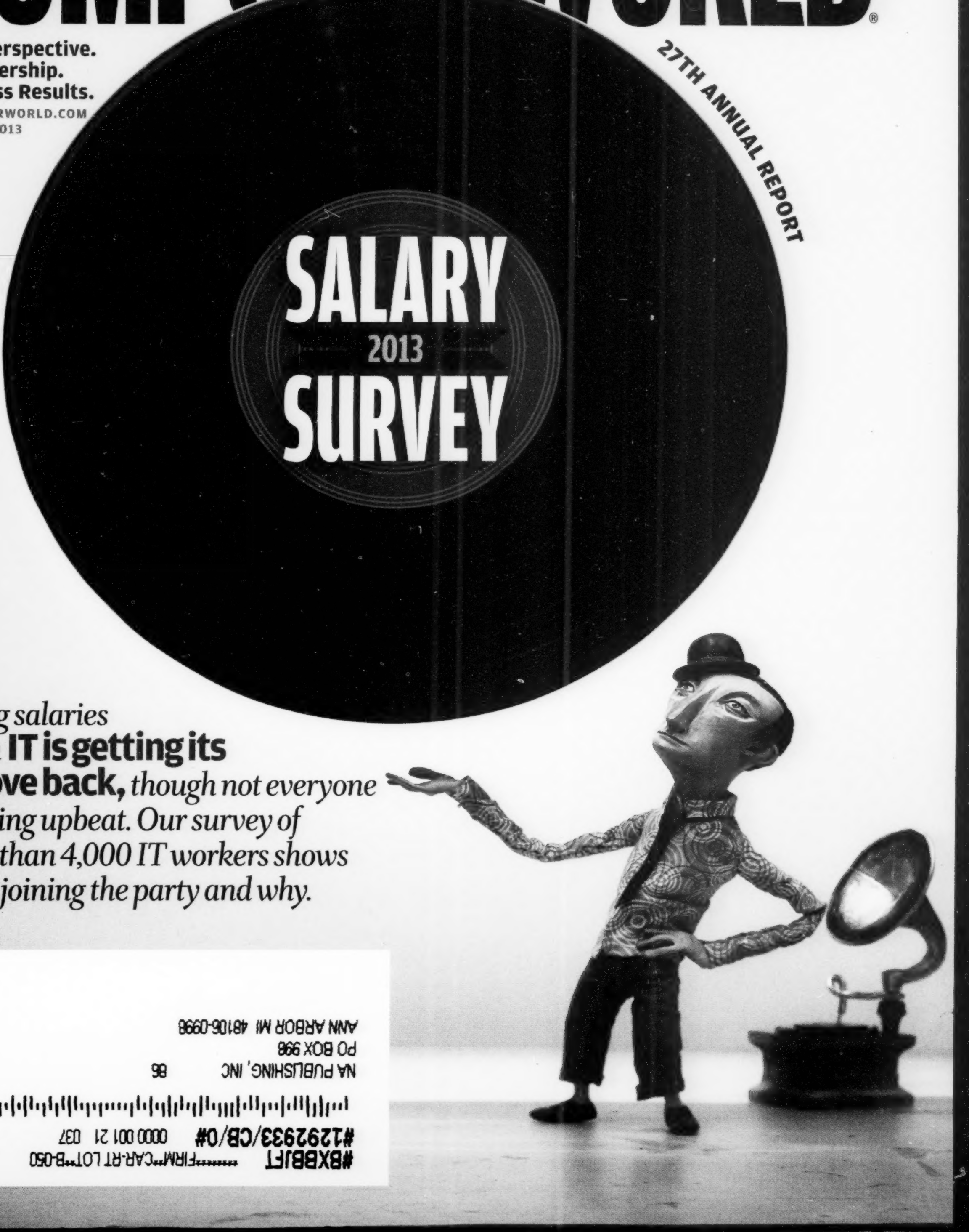

27TH ANNUAL REPORT

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Rising salaries mean **IT is getting its groove back,** *though not everyone is feeling upbeat. Our survey of more than 4,000 IT workers shows who's joining the party and why.*

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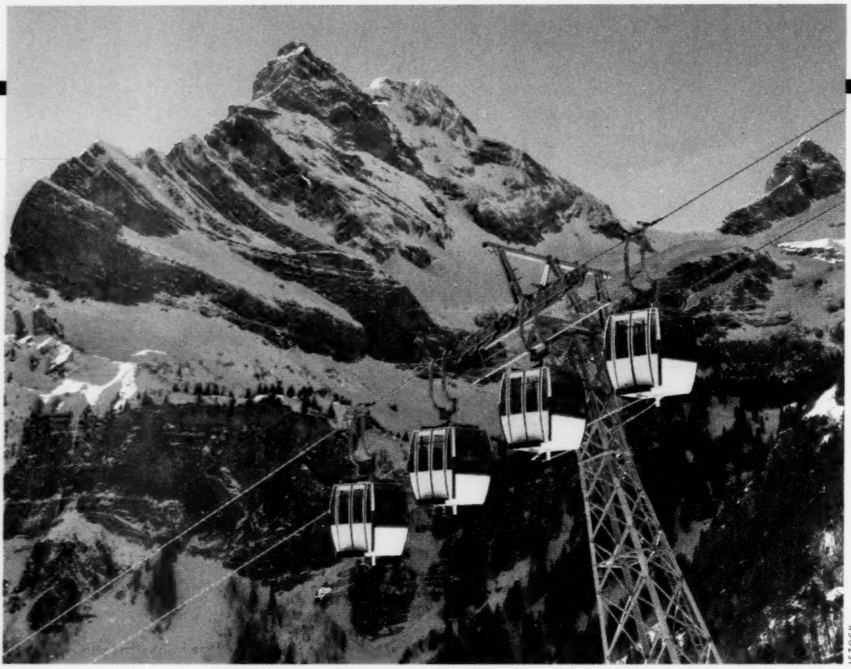

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HIGH-PERFORMANCE COMPUTING

Upgrade Aims for Better Alps Forecasts

THE SWISS National Supercomputing Center (CSCS) will upgrade its supercomputer with Nvidia graphics processors so the system can more accurately predict the weather in the Swiss Alps.

By upgrading the Cray XC30 system, the CSCS wants to give Switzerland's national weather service, MeteoSwiss, the ability to make specific forecasts for small valleys that current models can't discern, said Thomas Schoenemeyer, associate director of the technology integration team of the CSCS.

"Switzerland has one of the most complex topographies in the world," he said, noting that steep mountains can cause differences in weather patterns from valley to valley.

The supercomputer is called "Piz Daint," after one of Switzerland's mountain peaks.

In an undertaking that will take the rest of the year, CSCS will enhance Piz Daint so that it has enough computing power to reach speeds of at least one petaflop, up from its current maximum performance of 750 teraflops, said Schoenemeyer.

Due to become operational in early 2014, the upgraded system will use Nvidia Tesla K20X GPU accelerators to run 30 slightly different weather forecasting models simultaneously, according to Schoenemeyer.

The combination of CPUs and GPUs (graphics processing units) will lead to better application performance, he said.

Another aspect of the upgraded system is that it will use water from nearby Lake Lugano for cooling, and the water will later be reused to heat the CSCS building.

– Loek Essers, IDG News Service

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NANOTECHNOLOGY

Nanowires Could Boost Energy in Solar Cells 15x

Building solar voltaic cells from nanowires instead of standard metal conductors can increase the amount of energy the cells can capture by a factor of 15, according to a new study by scientists from the Nano-Science Center in Denmark.

Published recently in the journal *Nature Photonics*, the study found that nanowires have unique light absorption properties that make it possible to harness much more energy from the sun's rays than was previously thought possible.

The research focused on improving the quality of the nanowire crystals, which have a cylindrical structure with a diameter of 1/10,000th that of a human hair.

Nanowires concentrate the sun's rays into a very small area in nanowire crystals and, because the diameter of a crystal is smaller than the wavelength of light coming from the sun, this can cause resonances in the intensity of light in and around nanowires. The resonance, in turn, offers a higher conversion efficiency for the sun's energy, according to Peter Krogstrup, a researcher at the Niels Bohr Institute.

Nanowires have great potential for use not only in solar cells, but also in quantum computers, said Krogstrup.

However, he cautioned, "it will take some years before production of solar cells consisting of nanowires becomes a reality."

– LUCAS MEARIAN

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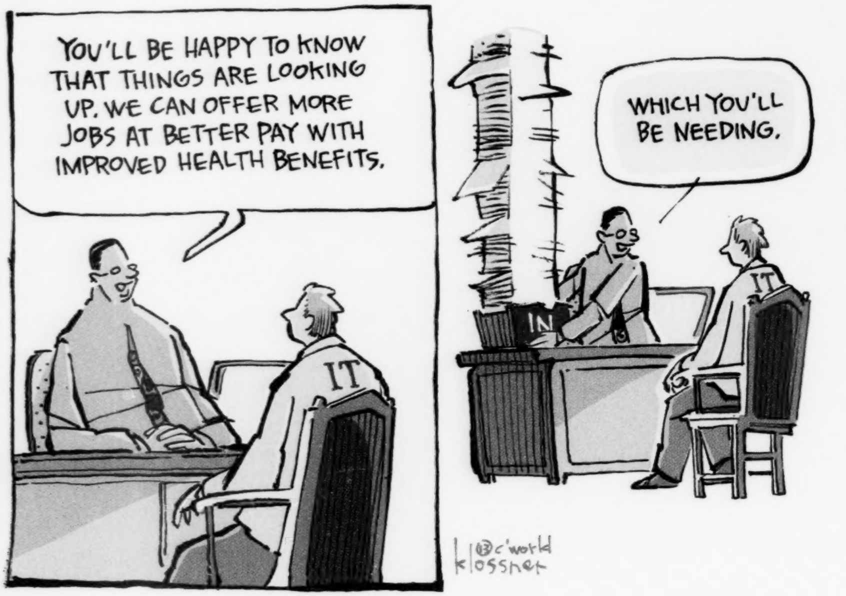
By John Klossner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GOVERNMENT IT

DHS Shifts to Cloud, Agile Development

IN A BID to improve its IT operations, the Department of Homeland Security has adopted agile development and is turning to cloud platforms.

At a recent hearing before the House Committee on Homeland Security, DHS deputy CIO Margaret Graves gave lawmakers an overview of agile software development methodologies.

As part of its agile approach, the department is creating "user stories" to help shape systems as they are being built, Graves explained. Users are "sitting with the developer, they are talking through use cases, they are testing at appropriate times," she said.

DHS transitioned to agile last year, Graves said in her testimony.

The intent of the hearing was to look at the progress of some DHS IT projects. Approximately 15% of the department's budget, or about $6 billion, is spent on IT.

Rep. Jeff Duncan (R-S.C.) cited reports by the Government Accountability Office (GAO) and the DHS inspector general that found fault with some of department's IT spending. Of the department's 68 major IT investments, about one-third had either gone over budget or had not been completed on time.

But David Powner, director of IT technology management issues at the GAO, who also testified, said he believes the agency is moving in the right direction.

That direction includes a shift to the cloud.

Graves said the DHS is consolidating 42 data centers into two, and has shut down 18 data centers so far. As part of this effort, it is implementing cloud services, including platform-as-a-service and software-as-a-service, and is moving its email system to a cloud platform.

With cloud-based systems, the cost per email box will be about $7 per user per year. That represents a substantial savings, said Graves, noting that the Federal Emergency Management Agency, which is part of DHS, has spent about $24 per user per year.

– Patrick Thibodeau

Micro Burst

Worldwide IT spending is projected to hit

$3.8 trillion

this year, up 4.1% from 2012

EMERGING TECHNOLOGY

Next-Gen Circuits Could Work Like The Human Brain

IBM has found a way to make transistors that could be fashioned into virtual circuitry that mimics how the human brain operates.

The new transistors would be made from strongly correlated materials, such as metal oxides, which researchers say can be used to build more powerful – but less power-hungry – computation circuitry.

"The scaling of conventional-based transistors is nearing an end, after a fantastic run of 50 years," said Stuart Parkin, an IBM fellow at IBM Research. "We need to consider alternative devices and materials that operate entirely differently."

Researchers have been trying to find ways of changing conductivity states in strongly correlated materials for years. Parkin's team is the first to convert metal oxides from an insulated to conductive state by applying oxygen ions to the material. The team recently published details of the work in the journal *Science*.

In theory, such transistors could mimic how the human brain operates in that "liquids and currents of ions [would be used] to change materials," Parkin said, noting that "brains can carry out computing operations a million times more efficiently than silicon-based computers."

JOAB JACKSON,
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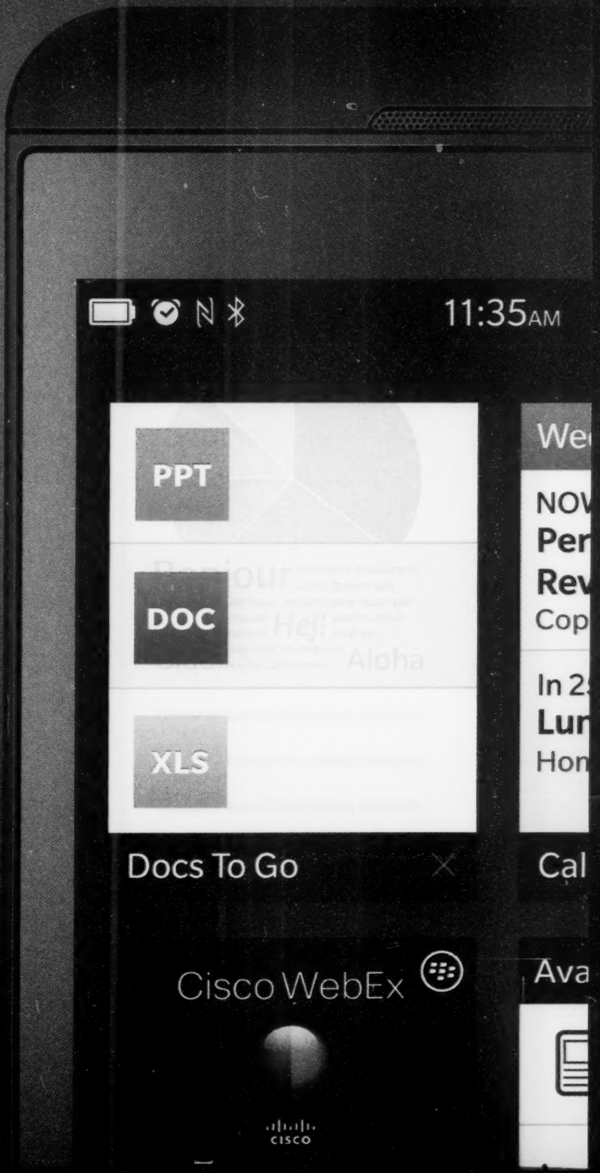

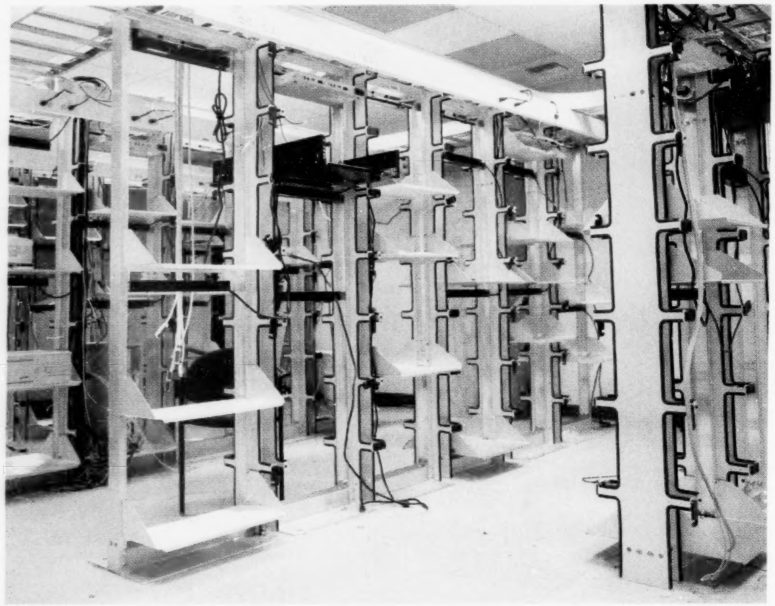

Pulling the Plug on Small In-house Data Centers

As IT workers with key skills grow scarce and the costs of upgrading data centers rise, many CIOs are replacing in-house ops with cloud-based services. By Patrick Thibodeau

VIRTUALIZATION AND CLOUD SERVICES are making it easier for companies to shift IT infrastructure operations to service providers, and that is exactly what many organizations are doing.

The trend is most prevalent among small and midsize companies, many of which are shutting down internal systems and shifting IT workloads to external providers because they want to save money and because they're concerned that it will become difficult to find people with the skills necessary to run data centers.

"I can't hire enough experts willing to work for a media company."

CTO,
IPG MEDIABRANDS

Large public- and private-sector organizations have been consolidating data centers for years by better optimizing in-house operations; the federal government, for example, is shutting down hundreds of data centers. But most of those enterprises only use cloud services at the margins.

"We are definitely seeing a trend away from in-house data centers toward external data centers, external provisioning," said Gartner analyst Jon Hardcastle.

Insurer OneAmerica is transferring its data center operations to a service provider because it's concerned that one day it won't be able to replace the experts who run its vital systems, said CIO Gene Berry.

By June, the company expects to complete the transfer of all of its IT services to T Systems North America, while cutting the size of its internal data center to 2,000 square feet from 25,000 square feet. The in-house facility will mostly support networking and will be managed by T Systems.

OneAmerica once employed about 65 people in its data center and used about 18 technologies. In some cases, only one or two people had the expertise to maintain specialized systems. "That gave us a lot of concern long-term," said Berry. "We didn't have the ability to hire backups."

Hagen Wenzek, CTO at IPG Mediabrands, which manages Interpublic Groups media assets, also cited concerns about potential brain drain as a reason for shifting management of the company's SQL Server and SharePoint systems to managed services provider Avanade.

"I can't hire enough experts willing to work for a media company," said Wenzek, noting that most people with the skills he needs would rather work for tech vendors.

Avanade boosted the performance of the Microsoft technology that IPG Mediabrands uses and improved delivery of reports, said Wenzek. IPG Mediabrands has since shifted the focus of its IT hiring efforts to recruiting business analysts who can work with data and visualization tools, he added.

Hank Seader, managing principal of the Uptime Institute, said that it takes a "certain set of legacy skills, a certain commitment to the less-than-glorious career fields to make data centers work, and it's hard to find people to do it."

Do in-house data centers have a future? "I think only [at] the really large companies," said Berry, "[at] smaller companies, no."

Meanwhile, the closing of data centers has become a significant concern for IT professionals. Jobs with the best career paths are moving from data centers to fast-growing service providers.

For instance, IT hosting company Rackspace plans to hire 1,000 new employees over the next two years. In the 2012 Rackspace annual report, executives told investors that demand is growing in part because smaller companies lack the IT staff to manage infrastructure operations and don't want to buy new equipment. ◆

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[1] Based on IBM testing and documented in IBM System x® Virtualization Server Consolidation sizing methodology. IBM Flex System x240 supports 2.7X more Peak Utilization Virtual Machines (VMs) than previous generation BladeCenter® HS22V.

[2] Based on IDC white paper "The Economics of Virtualization: Moving Toward an Application-Based Cost Model," Michelle Bailey, November 2009, http://www.vmware.com/files/pdf/Virtualization-application-based-cost-model-WP-EN.pdf
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Oracle CEO Larry Ellison introduces the company's latest Sparc servers on March 26.

Oracle on Move to Single Chip Design

Analysts say the unveiling of midrange and high-end servers running Oracle-built Sparc chips that share the same architecture is a step toward fulfilling the company's post-Sun plans. By James Niccolai

ORACLE'S UNVEILING of a batch of servers based on new Sparc processors late last month marked what could be the start of an expected shift toward standardizing the vendor's two families of Unix servers on a single chip architecture.

Oracle currently sells two lines of Unix servers: the midrange T-Series, based on Sparc processors designed in-house, and Fujitsu-built high-end M-Series machines running the Japanese manufacturer's Sparc64 chips.

On March 26, the same day it introduced a batch of new T-Series boxes, Oracle unveiled the first M-Series server that it had designed — and the first to run Oracle-built Sparc processors. "This is all Oracle [intellectual property]," said Marshall Choy, the vendor's director of systems solutions and business planning.

Observers have been expecting Oracle to move the two lines to a single chip architecture since it finalized its acquisition of Sun Microsystems in early 2010. Analysts have said that such a move would reduce hardware and software development costs at a time when Oracle hardware sales are declining.

"This is really the first instance of them delivering on this promise," said Nathan Brookwood, an analyst at Insight64.

Choy would not confirm that the launch of the new M-Series server marks the first step of an Oracle plan to have its own Sparc chips run all or most of its symmetric multiprocessor (SMP) systems, though analysts contend it's been the vendor's strategy for a long time. "They've been saying they would do this for years," Brookwood said.

The new high-end M-Series SMP server runs a new six-core Oracle processor called the Sparc M5, and supports up to 32TB of system memory. The Sparc M5 chip shares the same core as the new 16-core Sparc T5 processor that runs the five new T-Series servers.

The difference between the T5 and M5 processors is that Oracle has removed some of the cores on the M5, which aren't as useful in SMP systems. Engineers also added much bigger Level 2 cache memory — six times bigger than the T5, Choy said.

Brookwood said Oracle's single architecture strategy is comparable to the one Intel pursues with its x86 cores. Intel generally develops one processor core and adjusts the number of cores per chip, the cache size and other features for specific servers, he said.

A single chip architecture also fits Oracle's preference for designing entire bundled systems — chips, operating systems, databases and applications — in-house. The company argues it can build higher-performance systems that way, though some observers point out that such an approach ties customers to an all-Oracle stack of hardware and software.

"It's the right strategy for them; what they're really selling is integration," said Joe Clabby, an analyst at Clabby Analytics.

But he also wondered whether developing microprocessors is still a viable pursuit for Oracle. "They just came off a bad quarter; how much longer can they keep investing in this?" Clabby asked.

Brookwood, however, said moving to a single chip design could save money and free up funds for investment in Sparc chip development. "Don't forget that Oracle sells a lot of software wrapped around these systems," he said. ◆

Niccolai *is a reporter with the IDG News Service*

It's the right strategy for them; what they're really selling is **integration."**

ANALYST, CLABBY ANALYTICS

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Chris Curran

PwC's chief technologist says CIOs ought to be primed to take on dual roles.

Family: Wife of 25 years and two teenage sons.

Favorite tech toys: A Bluetooth stylus and my electric car.

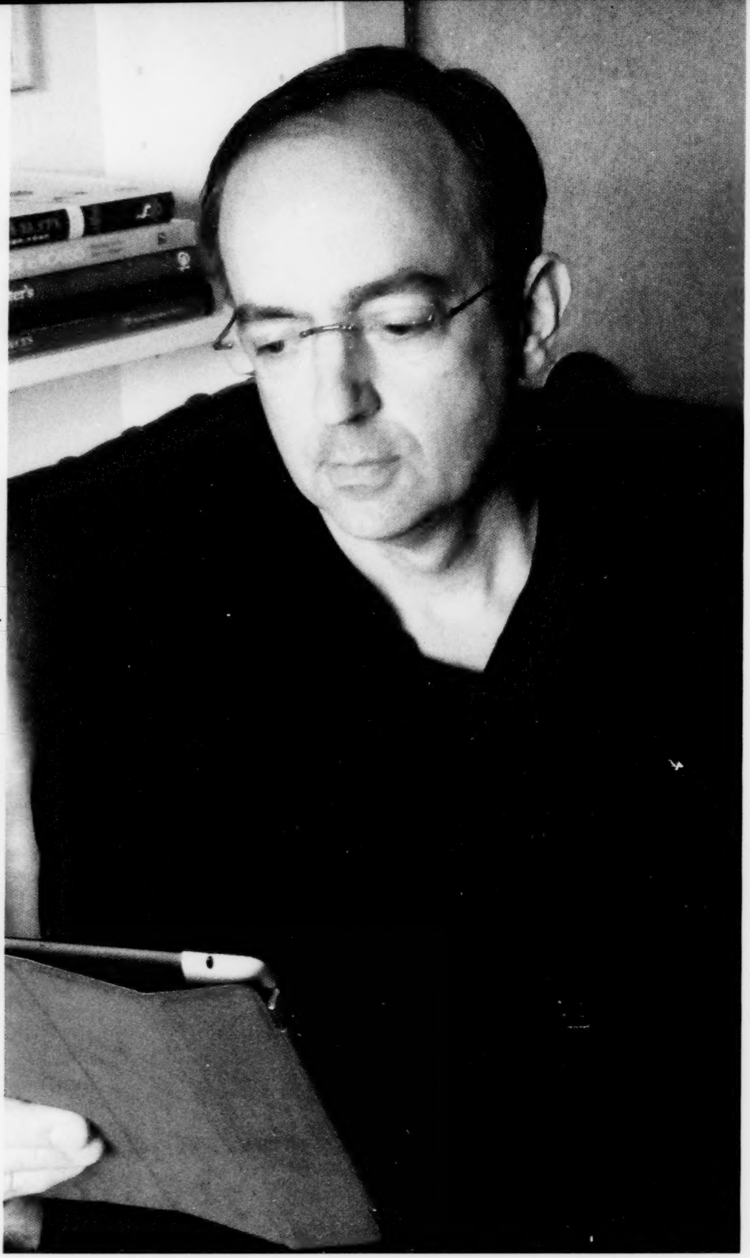
Are you ever completely unplugged? A few times a year on a beach, fly fishing or backpacking.

If you weren't in IT, what would you be? A chef.

Hobbies: Coaching and playing basketball, baking pizza.

Hometown: Plano, Texas.

A little-known fact about you: I've been to 10 Rush concerts.



FOR ALL YOU *CIOs out there, PricewaterhouseCoopers principal Chris Curran has a message: This is your year. Curran, who also serves as chief technologist for the U.S. business consulting firm's advisory practice, called 2013 "The Year of the CIO" in one of his recent CIO Dashboard blog posts. This turning point for the CIO job is just one of the trends that Curran sees. He says CIOs must be ready to harness the power of a slew of technologies if they want to say competitive. Here Curran offers insight into his vision for IT through 2013 and beyond.*

PwC has released its "2013 Top 10 Technology Trends for Business." Which of those trends are CIOs best positioned to make the most of? Pervasive computing is one that has a lot of traction and continues to have a lot of opportunities. We call it that because calling it smartphones or apps or mobile is too limited. Pervasive computing captures not just smartphones and apps and tablets but the opportunities emerging around individual

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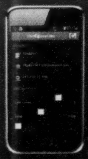

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devices. The pervasive computing trend is going to keep getting traction once enterprises get beyond the BYOD, the governance, the financial side of providing devices, and move into providing business applications in the mobile context. Once the platform — the phone, the management of the phone, security — is settled, it's "What do we do with this beyond email and calendar and the simple stuff?" That's probably the biggest opportunity.

Why is 2013 the year of the CIO? The last couple of years we've talked about the dual role of the CIO, the traditional role and a value-creating role of the CIO — driving new business, new products and services into the marketplace. And the reason I say it's a turning point for CIOs is we're seeing several different outlets calling for an explicitly new role — a chief digital officer — I've heard other names for it — that is trying to address this second role, this market-facing role. Because of this additional focus, it might be the time when CIOs finally get to make the case for taking both roles. It's an opportunity for CIOs to say, "See all that stuff they're talking about? That's my job, and here's why."

> It's an opportunity for CIOs to say, 'See all that stuff they're talking about? **That's my job, and here's why.'**

Are most CIOs up for making their case? Yes. Many CIOs are champing at the bit to bring the business more impactful and innovative ideas.

What is the biggest challenge facing CIOs this year? With all the discussions surrounding these emerging technology topics like mobility and social media, one of the big challenges is not to get caught up in the individual technology hype or the collection of these technologies, thinking these are going to solve my problems and I have to get them ASAP. One of the biggest challenges is to stay focused on the business needs and not the individual technologies.

Isn't that a lesson most CIOs already know? Many have learned this, but some can't do it on a regular basis because their business planning cycles don't include the IT planning piece early enough. [Others in the business] don't let IT help from the beginning and let IT help make the best decisions.

What is the single biggest area that CIOs need to be mindful of? Figuring out the mobile development standard for the organization is something they need to jump on, whether it's device-specific or something like HTML5, which is platform-agnostic.

You've written in your blog about CIOs breaking out of the "IT department mindset." How do you define that? The IT department mindset is that IT is largely or solely a support function. That's the old mentality. Most organizations are figuring out how to make IT a strategic creator of value. Some industries, like the large heavy manufacturing companies, think [IT is just a support function], and their mission is just to run efficiently and they just need IT to support that. But most of the clients I deal with are trying to figure out how to play both roles. Most CIOs get that, but in many organizations it's hard for them to do. And some of it requires pull-through from the CEO or others on the C-team.

What emerging technology are you personally most excited about? I think the next wave of things that we'll see is around sensors and more and varied types of purpose-built computers that people can wear or [that we can] put on a car or package. We'll see more small-scale computing that captures data, tracks positions or activities — and [we'll see it] in a lot more parts of business. There are devices that clip to your pocket that take pictures every 30 seconds or that you wear and track your activity. We're going to see more and more of that. I think it's more about the ability to get new types of data that can more specifically allow us to learn about our environment, our products, our customers. It's bringing more refined, customized data to the table.

As someone who's seemingly immersed in technology, do you ever worry about how wired we're becoming as a society? I think emailing when they're down the hall, instant messaging, texting has helped us to be lazier about building relationships and a lot of this C-level relationship-building. It worries me that we have so much technology-mediated communication.

— Interview by Computerworld *contributing writer* **Mary K. Pratt** *(marykpratt@verizon.net)*

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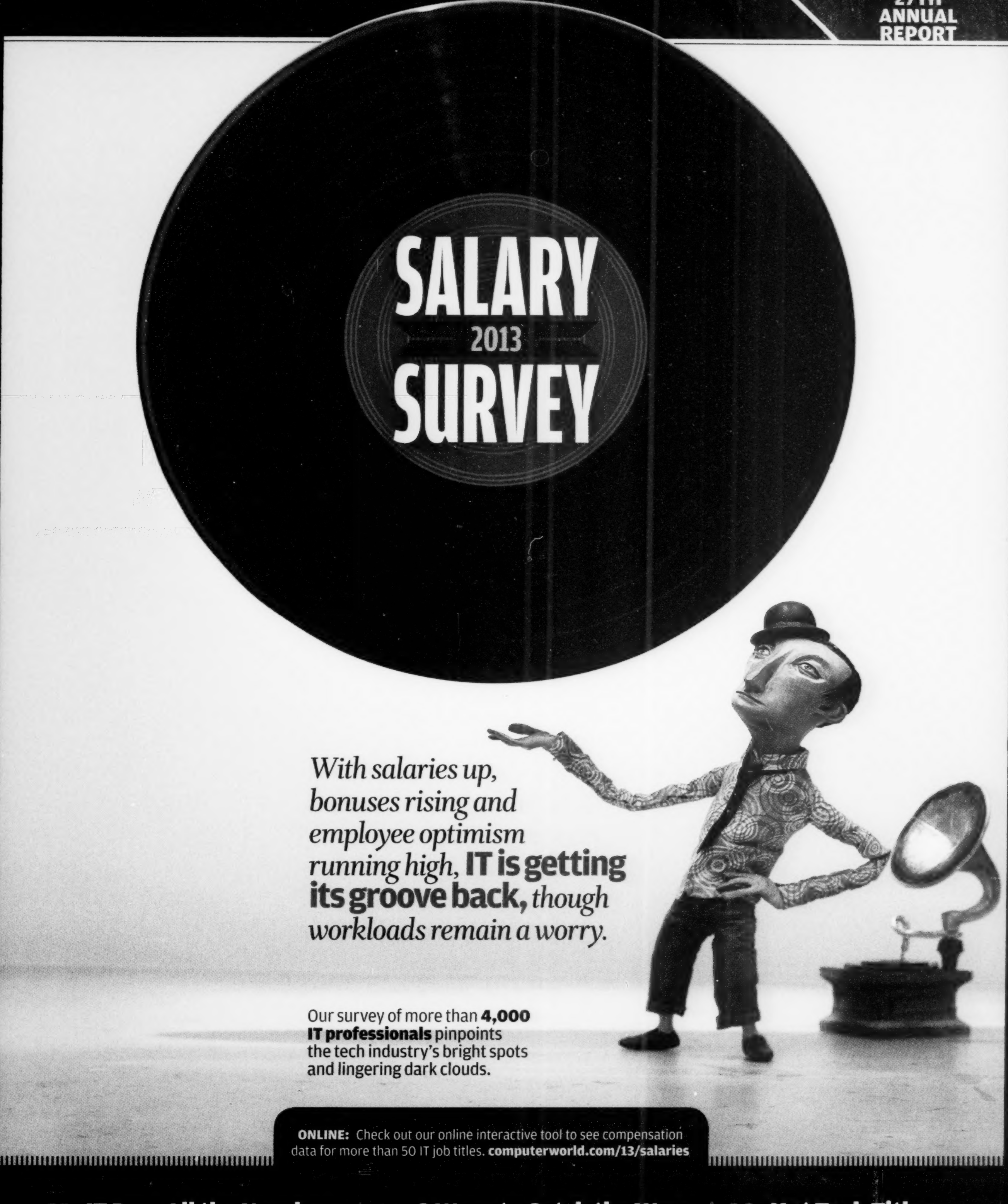

SALARY 2013 SURVEY

With salaries up, bonuses rising and employee optimism running high, **IT is getting its groove back,** *though workloads remain a worry.*

Our survey of more than **4,000 IT professionals** pinpoints the tech industry's bright spots and lingering dark clouds.

ONLINE: Check out our online interactive tool to see compensation data for more than 50 IT job titles. **computerworld.com/13/salaries**

22 **IT Pay: All the Numbers** | 28 **3 Ways to Catch the Wave** | 30 **Hot Tech Titles**

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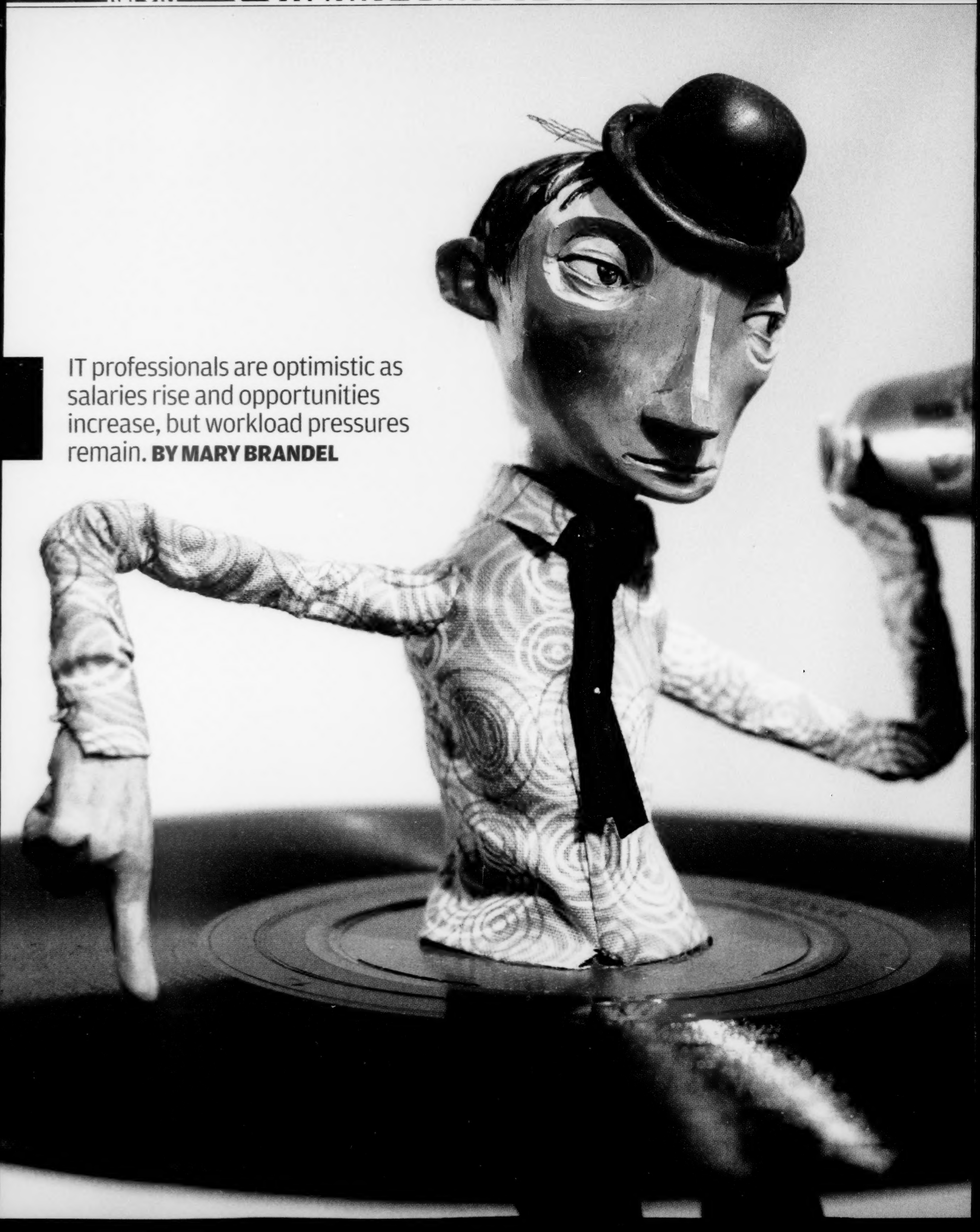
SALARY SURVEY 2013



IT professionals are optimistic as salaries rise and opportunities increase, but workload pressures remain. **BY MARY BRANDEL**

IT Gets Its GROOVE Back

A YEAR AND A HALF AGO, David Collins was trying to move from contracting work to a full-time position in IT. With rampant downsizing and a flood of new graduates, the job market was looking bleak in central Ohio, where he lives. "I knew of candidates with 20 years of experience and master's degrees who were taking entry-level positions just to get back into the industry," he says.

RED NOSE STUDIO

Today, Collins is an IT infrastructure manager at Residential Finance, a national mortgage lender in Columbus, and IT looks to him like a more solid profession. "We've certainly seen a market shift," he says. "There are more offers, and candidates can be more selective." Collins notes that he has "great" benefits, and since he was hired 18 months ago, his salary has increased and his company's IT staff has tripled in size (from seven to 21 employees) to keep up with business growth.

> **Depending on your skill set, I certainly think salaries are pretty comparable to before the big downturn.**
>
> **DAVID COLLINS,** IT INFRASTRUCTURE MANAGER, RESIDENTIAL FINANCE

Optimism is growing among IT workers, according to the results of the 2013 *Computerworld* Salary Survey. The 4,251 technology professionals who participated in this year's survey seem to be feeling better — not just about IT as a profession but also about the improving economy and the resulting improvement in job prospects.

As was the case last year, only a minority of survey respondents said a career path in IT and the potential for salary advancement are as promising now as they were five years ago. But optimism is on the rise: 38% of this year's respondents said they felt that way, up from 29% last year.

And while IT workers have wondered whether they would ever recover from the years of salary cuts, the percentage of 2013 respondents who said they gained ground financially in the past two years was slightly higher than it was in 2012 (33%, up from 29% last year), and the percentage of those who said they lost ground dropped (28%, down from 32%).

Another indicator of increased confidence: The percentage of respondents mentioning the economy as a challenge for IT workers continued to tail off, falling to 17% this year from 19% last year and 28% in 2011. "I don't know whether we'll ever see the [salaries] we saw during the dot-com boom, but depending on your skill set, I certainly think salaries are pretty comparable to before the big downturn," Collins says.

Money's Up, Jobs Are Back

The optimism may be partly due to a three-year streak of modest pay increases. Respondents to the 2013 survey reported that their salaries rose an average of 2.3%, which is slightly better than last year's average increase of 2.1% and 2011's more modest 1.5% uptick. Meanwhile, average bonuses across all job titles rose only 0.9% this year, but that too is an improvement over 2012, when bonuses decreased by an average of 1.1%.

Some job titles showed better-than-average gains. To cite just two examples, total compensation (salary plus bonus) rose 3.9% for business intelligence analysts and 3.6% for software engineers.

Overall, more than half (57%) of this year's respondents reported receiving a raise, compared with 47% last year.

All that reflects what recruiters are seeing in the marketplace. Matthew Ripaldi, senior vice president at IT staffing firm Modis, reports salary hikes of about 5% for both permanent and contract positions, and even higher bumps — into the double digits — for developers and software engineers. "We're seeing validation of this every single day, in all of our branches and across industries," he says.

The positive vibe could also be the result of ongoing reductions in negatives: This year's survey showed that budget cuts, hiring freezes, layoffs, training cuts and cancelled projects continued to tail off, after a more dramatic decline in 2012.

Perhaps the biggest driver of the new optimism is an increased demand for IT professionals in what recruiters are calling an employee's job market. The Association for Computing Machinery, for example, projects that the number of new computing jobs will increase by 150,000 per year for the next eight years. Meanwhile, the unemployment rate among U.S. IT workers was significantly lower than the overall unemployment rate in the fourth quarter of 2012 — 3.3% versus 7.8% — according to technology job board Dice.com.

That robust demand likely explains the precipitous decline — from 36% in 2012 to 27% this year — in the percentage of survey respondents who cited a poor job market as their reason for not seeking new employment.

"If you look at time-to-fill ratios, we're seeing an increased sense of urgency among hiring managers," Ripaldi says. "If we have a candidate interview at 10 a.m. and the manager doesn't call back by 4 p.m., there's a good chance [the candidate] will have already left for another opportunity." Ripaldi is also seeing employers work harder to secure talent, offering perks such as flexible hours and the opportunity to work from home.

HOW WE CONDUCTED THE SURVEY

Computerworld's 27th annual Salary Survey was administered via the Internet. The survey results include responses from both *Computerworld* print subscribers and visitors to *Computerworld.com*.

The collection of data began on Oct. 9, 2012, and concluded on Dec. 17. A total of 5,046 people responded to the survey. Of these respondents, 4,251 were employed full time or part time and were eligible to complete the entire survey. At the 95% confidence level, the margin of error for this sample size is 1.5 percentage points.

Compensation figures for 2012 were calculated based on the percentage change reported by the respondents.

MORE ONLINE: For a detailed look at the survey methodology, visit **computerworld.com/13/salaries.**

IT ON THE UPSWING

Salaries, bonuses and raises trend upward…

	2011	2012	2013
	4,852 respondents	4,337 respondents	4,251 respondents
Average increase in salary	1.5%	2.1%	2.3%
Average increase in bonus	0.3%	-1.1%	0.9%
Received a raise in the past year	52%	47%	57%

ECONOMIC WORRIES START TO FADE

What do you feel is the biggest challenge facing workers in the IT industry today?

	2011	2012	2013
	4,834 respondents	4,324 respondents	4,239 respondents
The economy	28%	19%	17%

Among those not looking for a job, why aren't you looking?

	2011	2012	2013
	2,328 respondents	2,185 respondents	1,979 respondents
Job market is poor; opportunities are few	40%	36%	27%

FEELING BETTER ABOUT PROSPECTS FOR IT

Given the current economy, do you believe a career path in IT is…

	2012	2013
	4,337 respondents	4,251 respondents
More secure than most other career paths	44%	47%
As secure as most other career paths	43%	41%
Less secure than most other career paths	13%	12%

Do you believe that a career path in IT and the potential for salary advancement is as promising today as it was five years ago?

	2012	2013
	4,337 respondents	4,251 respondents
It is as promising today	29%	38%
Not as promising	53%	44%
Unsure	18%	18%

Over the past two years of your career, do you feel you have financially…

	2012	2013
	4,337 respondents	4,251 respondents
Gained ground	29%	33%
Stayed flat	39%	39%
Lost ground	32%	28%

Greener Pastures

Samuel Satyanathan has benefited from the increasingly generous offers. He recently accepted a new position as senior solutions architect at a large telecommunications company. He was generally happy with his former employer, a financial services company, but was open to the right opportunity, he says.

The offer Satyanathan accepted was "appealing in every way, in terms of career growth and compensation package," he says. "But the important part was really getting to be part of something where I get to do more and possibly grow more." It also helped, he says, that the new company was very flexible about the timing of the transition, allowing him to collect a promised bonus from his former employer before starting in his new job.

During his time in the job market, Satyanathan says he observed a higher demand for and lower supply of IT professionals, and salary offers that were roughly 10% higher than job hunters' current salaries. Demand seems particularly high for people with expertise in iOS and Android development, Java, J2EE, application/enterprise architecture and agile development, he says.

Maurice Jenkins, director of information systems and telecommunications at the Miami Dade County Aviation Department, says salaries have suffered in his organization because of government spending cuts. With IT compensation improving in the private sector over the last year or so, he has seen 5% attrition among his staff as higher salaries are offered to people with in-demand qualifications such as Cisco networking certifications, Oracle development experience and expertise in forensics, firewalls and other enterprise security specialties, Jenkins says.

In addition to offering higher salaries, companies are wooing employees with quality-of-life perks like telecommuting, Ripaldi says. And in some instances they're offering better health insurance and other benefits, which had taken a hit in recent years.

Last year, Satyanathan declined to accept a position that delayed health insurance benefits for three months after the new hire's start date. "The hiring manager mentioned that the delay in the start of benefits was a sticking point for a lot of candidates," he relates, adding that a recent ad for a similar job at the same company stated that benefits would start on day one.

Workload Pressures Continue

If salaries and demand are up, so too is the pressure to perform. As they have for several years, survey respondents reported a disconnect between compensation and workload. Among those who said they felt more pressure over the past year to increase productivity (68%) or take on new tasks (75%), only 12% reported that their salaries had been adjusted to reflect the added workload.

In some cases, technological developments that were supposed to make IT's life easier are at least partly to blame. "Virtualization was supposed to make everything easier, right? Wrong," says George Theochares, IT director at Campbell Campbell Edwards & Conroy, a law firm in Boston. "They just expect more out of you. Where I used to maintain a dozen machines, I'm now managing 50 or 60 [virtual servers]." And as reliance on technology increases, business users' expectations are higher than ever. "In the past, if we were down a few hours or even a day, people didn't panic, but that's not the case anymore," Theochares says.

The consumerization of IT is also increasing pressure on tech professionals — without an accompanying increase in pay. "In the last three years, it's become harder to keep up," says Eric Shaver, senior vice president of IT at The Plateau Group, an insurance holding company in Crossville, Tenn., that specializes in credit insurance and other loan-related products for financial institutions.

Shaver's company is growing quickly. Its accounts have tripled and its revenue has grown from $43 million in revenue to $88 million in two years, as it has expanded into 48 states from just eight. Although Shaver has been able to expand his IT staff, and hopes to add more employees this year, "it's been tight because of the additional areas we have to cover," he says.

Salaries at Shaver's organization have increased 3% in the past year, and benefits have improved, thanks to changes in healthcare options. However, "overall compensation is lower than we'd like to see," he says. "It's not as competitive as we'd like it to be, and it's something we're working on."

High Output Highly Valued

The pressure to operate at highly productive levels isn't likely to let up anytime soon, according to Ripaldi, as employers continue to seek IT professionals with multiple skill sets to squeeze as much as they can out of their investments in labor. "Sometimes that's a challenge for workers because it's really two positions in one," he says. "The hiring manager might only have one position available but is trying to fill two voids, so he's looking for a senior-level person who can wear multiple hats."

Shaver agrees that the opportunities today are geared toward "anyone who isn't trying to be a one-trick pony." IT professionals, he says, "need to expand their portfolio of skills to survive. There's more and more coming at us."

The uptick in hiring won't result in IT professionals working fewer hours, says Ripaldi. Instead, it will lead to more people generating higher levels of output than a year ago. "There is a lot of productivity out there, and that isn't going to change," he says.

Those higher levels of output may be one reason why IT professionals like Satyanathan see growing appreciation for the value of IT. After years of outsourcing and depleting its internal technical talent, his former employer has begun hiring back more on-site IT staffers, he says. "There is also an emphasis on streamlining the hiring process for people in technical roles and giving more options for these types of tracks to grow up the ladder within the organization," he says.

The Plateau Group's Shaver also sees change on the horizon. "Our company has had to spend to grow, and unfortunately, little of that has been in salary increases," he says. "But I'm hopeful that as things settle down with the growth phase that salaries will begin to match the growth of the business."

Even without a salary increase, Jenkins, of Miami Dade Aviation, has his own reasons for staying where he is, not the least of which is his belief in the future of IT, both in general and in aviation in particular. "There's a new mission every day, whether it's security, financials or new airlines coming on board needing new technology," he says. "Airports are an economic engine that needs to be fed, fine-tuned and maintained."

Beyond that, Jenkins sees the IT profession as central to the infusion of technology that's touching every aspect of life, in the home and in the workplace. IT, he says, "is a great place to be right now." ◆

Brandel *is a* Computerworld *contributing writer. You can contact her at marybrandel@verizon.net.*

WORKLOAD WOES PERSIST

Despite a growing optimism that the IT profession is a promising place to be, tech workers still see room for improvement, particularly in the correlation between salaries and workloads. In *Computerworld*'s 2013 Salary Survey, only 23% of the respondents said that their salaries are keeping pace with business growth and demands.

Asked whether they think they are paid fairly, slightly more than half (51%) said they are underpaid based on their role and responsibility, and 85% reported pressure to increase productivity or take on new tasks.

George Theochares, IT director at Campbell Campbell Edwards & Conroy, says "compensation has not kept up, and working conditions have remained the same, with long hours and unrealistic expectations." Theochares has not had a raise in three years, and his bonuses have decreased. But he still believes that an IT career can be promising – if techies continually hone their skills and keep an eye out for new opportunities.

Samuel Satyanathan – who recently accepted a new position at a telecommunications company – observes, "the best way for me to get a raise was to accept a new job." At his previous employer, he felt slightly underpaid for his experience level compared with his peers at other organizations, and he found it difficult to move up over time. Annual raises were averaging 3% or less, he says, whereas job offers posted on the open market listed salaries that were 10% higher than what he was making.

Eric Shaver, senior vice president of IT at The Plateau Group, says salaries seem to be stable but working conditions continue to worsen as companies to try to do more with less. "I think companies want to compensate better, but sometimes they can't," he says. "As I've moved up the ladder, the pressure to deliver while the business grows is very heavy." Shaver hopes things will change, but so far, he says, "I don't see the compensation matching the increased pressures at this point."

– MARY BRANDEL

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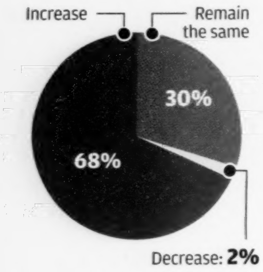
WORKLOADS ARE ON THE RISE

Over the next 12 months do you expect your workload and responsibilities to:



BASE: 4,336 RESPONDENTS

TOP 10 PRIORITIES

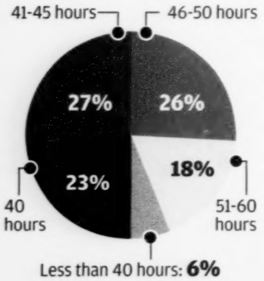
What matters most to you about your job?

Base pay	68%
Benefits	54%
Vacation time/ paid time off	37%
Job stability	35%
Flexible work schedule/ telecommuting	32%
Challenge of job	31%
Job atmosphere/ community	22%
Skills development/ training opportunities	22%
Career advancement and development	21%
Opinions and knowledge are valued	20%

BASE: 4,218 RESPONDENTS, MULTIPLE RESPONSES ALLOWED

LONG HOURS

How many hours per week do you work on average?



BASE: 4,249 RESPONDENTS

Senior Management Positions

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2013 TOTAL	2012 TOTAL	% CHANGE TOTAL COMP
CIO/vice president of IT	$146,809	$29,850	$176,659	$173,789	1.7%
Chief technology officer	$141,620	$25,012	$166,632	$162,851	2.3%
Director of IT	$111,514	$11,457	$122,971	$119,411	3.0%
Director of systems development	$125,278	$18,629	$143,907	$141,184	1.9%
Internet technology strategist	$125,161	$18,806	$143,968	$140,993	2.1%

Middle Management Positions

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2013 TOTAL	2012 TOTAL	% CHANGE TOTAL COMP
Application development manager	$101,670	$8,345	$110,015	$108,759	1.2%
Communications manager	$93,486	$6,081	$99,566	$98,775	0.8%
Computer operations manager	$83,589	$5,664	$89,254	$88,194	1.2%
Database manager/ data warehousing manager	$103,211	$8,371	$111,583	$111,226	0.3%
E-commerce/ Internet manager	$82,255	$3,465	$85,720	$84,537	1.4%
Help desk/ tech support manager	$65,957	$2,951	$68,908	$67,335	2.3%
Information security manager	$106,193	$5,020	$111,213	$108,719	2.3%
IT manager	$86,893	$4,793	$91,686	$90,165	1.7%
Network manager	$81,107	$4,334	$85,441	$84,253	1.4%
Product manager	$93,847	$7,683	$101,530	$98,029	3.6%
Project manager	$96,555	$7,205	$103,760	$102,847	0.9%

Staff and Entry-Level Positions

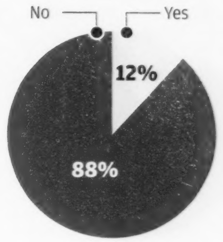
JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2013 TOTAL	2012 TOTAL	% CHANGE TOTAL COMP
Business intelligence analyst	$73,615	$6,013	$79,628	$76,609	3.9%
Communications specialist	$53,331	$6,050	$59,381	$57,047	4.1%
Computer operator	$49,389	$2,896	$52,285	$50,365	3.8%

Staff and Entry-Level Positions

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2013 TOTAL	2012 TOTAL	% CHANGE TOTAL COMP
Database administrator	$88,717	$4,403	$93,120	$90,843	2.5%
Database analyst	$64,523	$7,126	$71,650	$69,417	3.2%
Enterprise architect	$114,463	$14,347	$128,810	$124,875	3.2%
Help desk/ tech support specialist	$52,269	$2,351	$54,620	$53,670	1.8%
Information security specialist	$85,183	$5,750	$90,933	$88,887	2.3%
Network administrator	$57,935	$1,949	$59,884	$58,472	2.4%
Network architect	$96,413	$9,413	$105,826	$103,651	2.1%
Network engineer	$79,033	$2,980	$82,013	$80,873	1.4%
Programmer/ analyst	$75,254	$3,361	$78,615	$75,904	3.6%
Project leader	$82,289	$8,340	$90,628	$87,614	3.4%
Quality assurance specialist	$54,598	$3,429	$58,027	$55,816	4.0%
Software developer	$79,189	$4,164	$83,353	$81,166	2.7%
Software engineer	$87,933	$5,628	$93,561	$90,302	3.6%
Storage administrator	$88,335	$4,653	$92,987	$90,620	2.6%
Storage architect/ engineer	$96,019	$7,784	$103,803	$100,614	3.2%
Systems administrator	$70,837	$2,753	$73,590	$71,900	2.4%
Systems analyst	$75,115	$3,082	$78,197	$77,139	1.4%
Senior systems analyst	$85,405	$5,229	$90,634	$89,655	1.1%
Systems architect	$99,653	$9,224	$108,878	$105,976	2.7%
Systems programmer	$91,314	$5,712	$97,026	$94,847	2.3%
Technical trainer	$65,113	$1,419	$66,533	$65,328	1.8%
Technician	$47,943	$1,865	$49,808	$48,049	3.7%
Technology/ business systems analyst	$75,740	$5,226	$80,966	$79,464	1.9%
Web developer	$65,392	$1,790	$67,183	$63,406	6.0%

MORE WORK BUT NOT MORE PAY

If you've been asked to increase productivity and/or take on new tasks, has your salary been adjusted to compensate for the added workload?



BASE: 3,617 RESPONDENTS

MOTIVATED BY MONEY

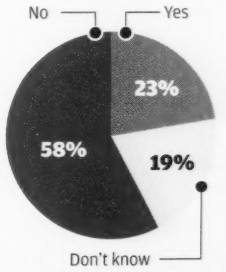
What would most influence you to seek a new job?

Salary increase	75%
Better work/ life balance	38%
Job security	38%
Access to new technology projects	34%
Large sign-on bonus	30%
Organization stability	29%
More vacation time	27%
More training	25%
More responsibility	24%
New title	15%

BASE: 4,240 RESPONDENTS, MULTIPLE RESPONSES ALLOWED

COMPENSATION DISCONNECT

Do you feel that your salary is keeping pace with business growth and demands?



BASE: 4,251 RESPONDENTS

A Sampling of Average Total Compensation by Region

JOB TITLE	New England	Middle Atlantic	South Atlantic	North Central	South Central	Mountain	Pacific
CIO/vice president of IT	$137,444	$186,382	$159,486	$155,967	$182,623	$214,460	$212,626
Director of IT	$123,634	$130,595	$111,817	$115,885	$118,706	$123,300	$137,797
IT manager	$107,722	$100,277	$99,363	$88,226	$86,542	$86,403	$99,121
Project manager	$108,905	$104,655	$109,083	$100,232	$114,057	$112,006	$111,881
Systems administrator	$74,512	$82,787	$78,727	$72,424	$74,739	$66,143	$85,527
Help desk/tech support specialist	$59,359	$51,287	$59,380	$51,039	$54,250	$54,404	$58,726
Network administrator	$61,675	$68,363	$64,092	$60,714	$52,208	$58,208	$58,597
Systems analyst	$90,800	$76,085	$81,462	$76,845	$88,210	$79,097	$79,983
Programmer/analyst	$104,420	$90,819	$74,954	$78,338	$82,720	$85,619	$91,588
Technology/business systems analyst	$94,350	$104,508	$83,930	$75,997	$78,418	$59,000	$87,385
Software engineer	$111,888	$105,544	$99,206	$95,130	$95,853	$93,496	$116,353
Network engineer	$99,836	$92,329	$81,824	$79,859	$83,959	$89,063	$90,302

RED TEXT: The total base for this job title in this particular region was fewer than 30 responses but more than 15. These figures should be used for comparison only, because they don't constitute a statistically significant sampling.

GRAY TEXT: The total base for this job title in this particular region was fewer than 16 responses. These figures should be used for comparison only, because they don't constitute a statistically significant sampling.

REGIONS

New England: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

Middle Atlantic: New Jersey, New York, Pennsylvania

South Atlantic: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, Puerto Rico, South Carolina, U.S. Virgin Islands, Virginia, West Virginia

North Central: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin

South Central: Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Oklahoma, Tennessee, Texas

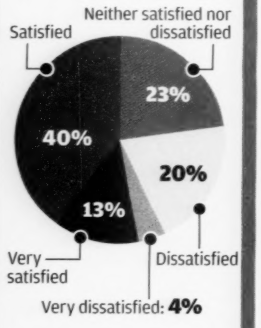
Mountain: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming

Pacific: Alaska, California, Hawaii, Oregon, Washington

Satisfaction Meter

MONEY

How satisfied are you with your total compensation package?



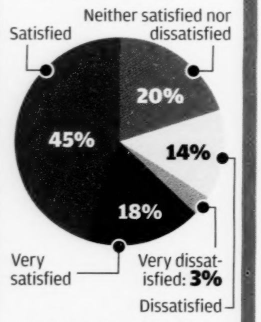
BASE: 4,330 RESPONDENTS

Compared with 12 months ago:	
More satisfied	**16%**
Less satisfied	**22%**
The same	**62%**

BASE: 4,337 RESPONDENTS

CURRENT JOB

How satisfied are you with your current job?



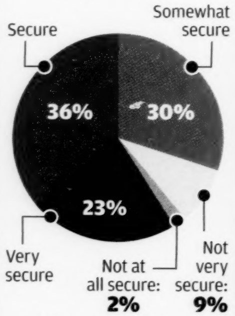
BASE: 4,244 RESPONDENTS

Compared with 12 months ago:	
More satisfied	**20%**
Less satisfied	**18%**
The same	**58%**
Not in the same position	**4%**

BASE: 4,251 RESPONDENTS

SECURITY

How secure do you feel your job is?



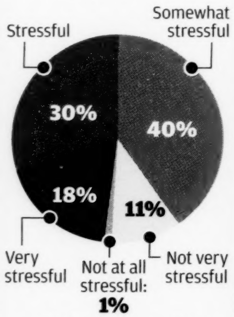
BASE: 4,243 RESPONDENTS

Compared with 12 months ago:	
More secure	**24%**
Less secure	**15%**
The same	**58%**
Not in the same position	**3%**

BASE: 4,251 RESPONDENTS

STRESS

How stressful is your job?



BASE: 4,244 RESPONDENTS

Compared with 12 months ago:	
More stressful	**18%**
Less stressful	**20%**
The same	**59%**
Not in the same position	**3%**

BASE: 4,251 RESPONDENTS

A Sampling of Average Total Compensation by Industry

CIO/vice president of IT

Education	$148,831
Computer services/consulting	$156,048
Health/medical services	$178,640
Manufacturing (noncomputer)	$162,824
Government	$137,308
Legal/insurance/real estate	$199,850
Banking	$116,575
Retail trade	$228,364

Director of IT

Education	$91,852
Health/medical services	$114,706
Manufacturing (noncomputer)	$145,260
Computer services/consulting	$165,930
Government	$103,083
Legal/insurance/real estate	$125,844
Nonprofit	$89,189
Entertainment/marketing/advertising	$128,630

IT manager

Manufacturing (noncomputer)	$99,037
Education	$85,229
Government	$92,111
Health/medical services	$88,807
Computer services/consulting	$91,204
Legal/insurance/real estate	$109,621
Retail trade	$82,251
Energy/utilities	$97,080

Project manager

Computer services/consulting	$99,338
Health/medical services	$106,800
Government	$100,450
Manufacturing (noncomputer)	$101,350
Banking	$95,338
Education	$85,525
Energy/utilities	$110,629
Legal/insurance/real estate	$107,000

Help desk/tech support specialist

Education	$48,865
Health/medical services	$56,015
Computer services/consulting	$54,105
Manufacturing (noncomputer)	$55,586
Government	$52,744
Legal/insurance/real estate	$56,107
Finance/accounting	$64,978
Energy/utilities	$60,773

Technology/business systems analyst

Computer services/consulting	$88,433
Government	$78,097
Health/medical services	$74,400
Legal/insurance/real estate	$83,805
Education	$69,332
Manufacturing (noncomputer)	$58,273
Finance/accounting	$94,170
Telecommunications	$56,188

Network administrator

Education	$55,365
Manufacturing (noncomputer)	$63,129
Government	$52,517
Health/medical services	$60,883
Business services/consulting (noncomputer)	$53,613
Banking	$58,875
Computer services/consulting	$58,013
Finance/accounting	$45,800

Network engineer

Telecommunications	$78,288
Computer services/consulting	$76,667
Government	$71,829
Education	$65,698
Health/medical services	$81,817
Manufacturing (noncomputer)	$90,071
Energy/utilities	$94,750
Finance/accounting	$95,800

Programmer/analyst

Government	$80,019
Computer services/consulting	$62,334
Education	$66,295
Manufacturing (noncomputer)	$71,611
Health/medical services	$93,294
Legal/insurance/real estate	$88,978
Transportation/logistics	$87,360
Finance/accounting	$85,000

Software engineer

Computer services/consulting	$85,280
Telecommunications	$84,853
Manufacturing (computer-related)	$113,057
Finance/accounting	$96,815
Defense/aerospace	$113,545
Health/medical services	$102,909
Government	$99,076
Legal/insurance/real estate	$107,071

Systems administrator

Education	$70,148
Computer services/consulting	$76,703
Manufacturing (noncomputer)	$65,602
Health/medical services	$74,338
Government	$76,291
Telecommunications	$72,395
Legal/insurance/real estate	$81,138
Entertainment/marketing/advertising	$61,250

Systems analyst

Health/medical services	$76,085
Computer services/consulting	$79,454
Manufacturing (noncomputer)	$79,135
Government	$71,482
Education	$64,176
Finance/accounting	$107,445
Banking	$78,329
Energy/utilities	$94,325

RED TEXT: The total base for this job title in this industry was fewer than 30 responses but more than 15. These figures should be used for comparison only, because they don't constitute a statistically significant sampling.

GRAY TEXT: The total base for this job title in this industry was fewer than 16 responses. These figures should be used for comparison only.

OPINION

DEBBIE MADDEN

3 Steps to Hiring Slowly, And Hiring Well

When the right person passes your interview process, make an offer the same day.

WHILE THE ECONOMY as a whole remains slow-moving, 2013 is actually shaping up to be a year of growth, innovation and opportunity in the tech sector. That means that IT workers have good reason to be optimistic about their job prospects, and the 2013 *Computerworld* Salary Survey supports that: The percentage of respondents who said that the job market is poor or offers few opportunities decreased from 36% last year to 27% this year.

Organizations will be looking to not only fill new IT roles, but also backfill roles that have experienced turnover.

But the dynamics of the job market have changed. Real-time data-sharing tools (think Twitter, Quora and LinkedIn) allow job hunters to tell all of their professional contacts that they're looking for work with a single status update. How do these new technologies affect the people responsible for hiring? In the age of rapid-fire information exchange, does the old adage "hire slowly, fire quickly" still ring true?

As someone responsible for hiring tech talent, my answer is yes. Here are some strategies to ensure that you "hire slowly" and wisely but don't miss out on good candidates:

1. Know what you want upfront. The more you can focus in on what you want in an employee in a specific role, the easier it will be to spot a match.

Start by listing the skills and qualities you need, and then create a one-to-one map to ensure your hiring process includes a step to test for each.

Example: Say that you need to hire for a position demanding a high level of integrity. Or perhaps you need to hire someone who is extremely proficient at typing. How, and at which stage in the interview process, do you test for these attributes? Once, when hiring a tech recruiter, I conducted a series of interviews and exercises with an applicant but never assessed his computer skills. This oversight came to light soon after he was hired: His first day on the job I discovered he couldn't type. Had I better mapped the position's needs to my assessment exercises, I could have avoided that mistake.

2. Form a small, mutually beneficial network. Cultivate relationships with professionals whom you respect and who have needs adjacent to your own. Use this network to refer strong candidates and get referrals sent to you.

Example: I hire Ruby developers but not architects. When I interview a solid architect, I refer that person to someone in my network who needs architects. I am helping someone find a job and helping someone in my network.

Keep these relationships thriving by, for example, telling your contacts about upcoming IT events, using social media to spread the word about their hiring needs or catching up over coffee.

3. Remember that "hire slowly" doesn't mean "be slow to make a job offer." On the contrary, it pays to act swiftly at this stage. Being prepared by knowing what you want upfront and maintaining a network of contacts increases your odds of having strong candidates. And if you have strong candidates, you can close the deal quickly. When you find a match, let that person know as soon as possible. Don't spend days or weeks deciding whether or not to make an offer — you'll just end up learning that the candidate took another job.

When the right person passes your interview process, make an offer the same day. ◆

Debbie Madden is executive vice president at software developer Cyrus Innovation. You can contact her at dmadden@cyrusinnovation.com.

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SALARY SURVEY 2013

3 WAYS TO CATCH THE WAVE

FOR YEARS, Nick Brattoli had what some would consider an enviable IT job: It was steady, wide-ranging and at times, downright cushy. Working for a nonprofit mental health care organization as a Web and SharePoint specialist, Brattoli helped build the corporate intranet, trained employees and tended to traditional hardware and network support. He was reasonably paid and had ample vacation time. And the work came in fits and starts, so there was plenty of downtime.

Brattoli was content, but he didn't feel challenged. "It was a nice place to work — I got pay raises and decent projects, but I was stuck in terms of title and responsibility," says Brattoli, 28. So after three years at the post, Brattoli embarked on a meticulous, monthslong job search to find a new position in the healthcare field that would

Feeling left out? Here's how to join the IT party in progress.

BY BETH STACKPOLE

RED NOSE STUDIO

let him spread his wings. “I’m too young to be settling. I wanted to move toward leadership, and I really like learning. My old environment wasn’t conducive to that.”

Brattoli’s search landed him a post as a SharePoint implementation engineer at Medseek, a provider of patient engagement software based in Birmingham, Ala. Although it’s a comparable position, he’s working on large-scale, state-of-the art projects like electronic medical records, patient portals and analytics, and there’s plenty of room for growth.

Brattoli’s message to other IT professionals? “If you’re not happy, now is the time to work on it,” Brattoli says. “It’s a good time for IT.”

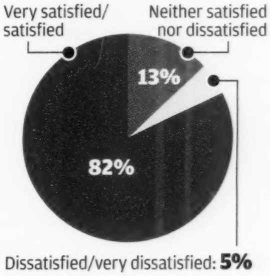
While unemployment is still high in many fields, that’s not the case in IT, according to John Reed, senior executive director at Robert Half Technology, an IT staffing firm. In fact, Reed says, the IT hiring picture has been pretty rosy for 24 months, driven by the explosion of new technologies, such as big data, cloud computing and mobile, and by sweeping changes in the economy, such as those brought about by healthcare reform.

“IT is really in a renaissance right now,” Reed says. “For several years, IT was in a quiet period in terms of innovation. Now, IT is being viewed for its potential to revolutionize a company, and it’s a cool place to be.”

Like Brattoli, many of the 4,251 IT professionals who participated in the 27th annual *Computerworld* Salary Survey are riding that upswing, using the momentum to switch companies or change positions in their quest to find deeper career satisfaction. Here’s how to join them on that journey.

THE ROAD TAKEN

How satisfied are you with your decision to pursue a career in IT?



BASE: 4,245 RESPONDENTS

Be of Service to the Business

Last October, Joe Scheible took a full-time job as a disaster recovery project manager at AIG after spending nearly 30 years working as an IT contractor — at AIG and elsewhere. Scheible, who was diagnosed with cancer earlier in the year, felt extremely loyal to AIG, which had held his contracting post open during his illness.

When AIG offered him a full-time position, he was quick to get on board. The good salary and generous benefits package were big draws, but what really sealed the deal were the chance to work with data center professionals around the globe and AIG’s commitment to technology. “AIG places a huge degree of emphasis on IT and how it can be used to enhance the business,” Scheible says.

In Jeff Fandl’s experience, helping a business achieve its core objectives is key to long-term career happiness and success in IT. “When you start to get midlevel or senior in your career, you’ve got to get out from behind the desk and talk with business users,” says Fandl, who in December 2012 took a job as director of IT infrastructure at Sanare, a maker of diabetes management products. “You need to understand what their pain points are and how you can enable them to solve their problems.” Fandl says he previously did a stint at an IT outsourcing company, where he honed the client service and business skills that readied him for his next leap.

Refresh Your Skills – Again and Again

Tech pros who want to take advantage of the IT upcycle need to identify any gaps in their skills and, if necessary, invest their own time and money in training to fill those gaps.

Fandl stays on top of hot IT issues and technologies by attending conferences and networking events.

Jason Mathews, an IS manager at property management firm Keystone Management, attends online webinars and participates in online communities when he’s off the clock. He sees learning as a continuous process. “This is one of those careers where the learning never stops or you’ll be left behind,” Mathews says.

Even if they aren’t planning to jump ship, IT workers should look for opportunities to develop new skills within their own organizations, says Don Knepper, a veteran of more than 25 years at toy maker Tomy International. Knepper has held a host of back-end and front-end database administration roles at Tomy, and since 1997 he has been manager of information analysis — an evolving role that allows him to pick up new skills all the time.

“We have a philosophy here of joint application development. The user community sees IT as a partner,” Knepper explains. “Rather than telling us, ‘This is what I need, go do the work,’ they see us as providers of information and experts in how business processes work. I don’t know if [a little extra money] in my paycheck would make me work any harder than getting a pat on the back from a co-worker in the business saying ‘Thanks for helping me on that problem.’”

Bring Passion to the Project

Joseph Moreau has been vice chancellor and CTO for the Foothill-De Anza Community College District in California since last June. He wasn’t looking for a new opportunity before he took the job, but he says the change has proved rewarding nonetheless.

Moreau, who spent five years as CTO of the State University of New York at Oswego, says he became open to the overture from Foothill-De Anza after realizing that his leadership style and overall sensibilities were most closely aligned with the mission of a community college.

In his new post, Moreau says he plans to play a leadership role in making higher education more affordable and valuable for students, leveraging technologies like virtualization and mobile and developing new online learning capabilities and new modes of student-teacher collaboration. He says the district’s location in the heart of Silicon Valley gives him access to CIOs from many industries and provides him with the opportunity to establish partnerships with nearby high-tech giants like Apple and Cisco.

Having a passion for your employer’s mission is the root of job satisfaction, Moreau maintains. “The satisfaction I derive from work is about the opportunity for creativity and experimentation and working in a climate that is very receptive to that,” he says. “That, more than anything else, will help you navigate the rough spots in the IT world.” ◆

Stackpole, *a frequent* Computerworld *contributor, has reported on business and technology for more than 20 years.*

RED NOSE STUDIO

WANTED: Jack OF TWO TRADES

Today's hot titles are business-tech hybrids.

BY STEPHANIE WILKINSON

THE LAST TIME IT found itself awash in new job titles, evangelists, gladiators and gurus ruled the day.

As IT's fortunes rise again, a second wave of new titles is swirling through the industry. But this time around, the titles reflect a seriousness of purpose as IT continues its seismic shift from service provider to strategic business partner.

"Back in the dot-com boom, we saw a huge array of hip job titles. It was a way to attract talent to have a job with a word like *ninja* or *master* in it," says Laura Kelley, a vice president at IT staffing firm Modis. "Since the economy has gotten a little better, we see it happening again. What is new is the substance of a lot of those jobs — big-data-driven jobs that focus on business intelligence."

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Indeed, the job title with the highest increase in total compensation (salary and bonus) in *Computerworld*'s 2013 Salary Survey is one that not long ago might not have been classified under IT at all: business intelligence analyst. That job saw an average salary increase of 3.9% and an average bonus increase of 3.5%, compared to overall average increases of 2.3% for salaries and 0.9% for bonuses among all survey respondents.

The ongoing effort to capture and deploy data to drive business value puts pressure on IT to stop sitting in the bleachers and get into the game, Kelley says. As a result, IT organizations are on the lookout for switch-hitters — folks who have business breadth and tech depth and who can address market challenges, not just solve computing problems.

Director of IT Infrastructure

At The Judge Group, a professional services firm in West Conshohocken, Pa., a lean team of 26 full-time and two contract IT staffers supports 450 full-time employees and close to 5,000 contractors. A little over a year ago, the company created the position of director of IT infrastructure to bring some consistency of process and a higher level of service to the organization.

"Our IT shop is small, with a lot of custom code," says Mike Flicker, director of applications development and data architecture, who, along with the new infrastructure director, reports to the CIO. "We didn't have a lot of strategic planning. We needed IT to move from being a reactionary entity to being a strategic resource."

The new infrastructure director, David Armstrong, has been able to advise the CIO on which networking and cloud-based technologies to invest in to bolster the company's growth plan. And he also took a portion of the IT group that had been in some disarray — specifically, networking and the help desk — and imposed a healthy structure on it, according to Flicker.

"Through his leadership and the implementation of these processes, he got them on board and turned them around," Flicker says. "Their response time is so good now, I'd put them up against any in the world."

Chief Knowledge Officer

When David Rosensaft began putting together the team for his brand-new business, he too recognized the need for a high-level business-tech hybrid position. His company, Universal Medical Access, was officially funded six months ago and is developing a data-intensive integrated online service to improve healthcare delivery. His management team is made up of eight individuals with deep prior experience in their respective fields — "we're all gray-haired gurus," he says — who function collegially, regardless of title.

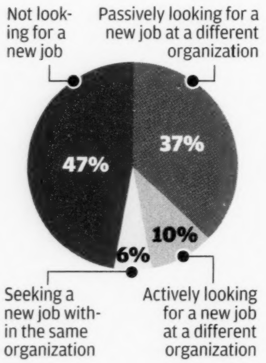
In addition to a CIO and several CTOs, CEO Rosensaft opened up a slot for a chief knowledge officer. The CKO works closely with the CIO but reports directly to Rosensaft.

"We needed someone who had enough experience with the medical field and a high degree of expertise in technology so he could help us be oriented both ways — facing in and facing out," Rosensaft says. The CKO, he adds, should be "someone who understands how to cooperate with outside entities and then can help us deploy that knowledge in all parts of the organization."

Rosensaft is optimistic that the CKO title will become more popular. "Right now, I'm not sure there's a standard definition," he says. "But it's been around since the early days of Microsoft and Apple. [Former Microsoft CTO] Nathan Myhrvold was basically a CKO. As companies embrace the network effects of technology, the CKO will be a more and more standard role, rather than just a buzzword. If you're a knowledge-based organization developing technology that requires profound domain expertise, you need this title in your operation."

STARTING TO LOOK

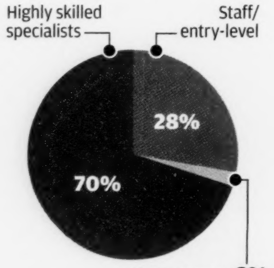
Which one of the following best describes your job search status?



BASE: 4,251 RESPONDENTS

WANTED: SPECIALISTS

If IT is hiring in your organization, are the majority of open positions for . . .



BASE: 623 MANAGERS EXPECTING TO INCREASE IT HEADCOUNT IN THE NEXT 12 MONTHS

Application Business Analyst

Not all of the hot job titles are positioned at the thin-air heights of the org chart. When Steve Hyde became CIO of Alta Resources in Nina, Wis., 15 months ago, he opened up a new midlevel position in the customer care company's 70-person IT group: application business analyst.

"When I came here, I noticed that each part of the business — HR, finance, IT — managed its own technology," Hyde says. "People were doing their own upgrades that ended up being incompatible with the infrastructure. They didn't necessarily know what was available in the market or what questions to ask a vendor."

The new application business analyst will work with the business teams on current and future processes, looking at what canned software packages are available and making sure what's chosen meets functional and business needs. He or she will bridge the gap that exists between IT and the functional units, Hyde says.

"It's a blended role — a combination of business analyst and project manager," he explains. "Unfortunately, I'm having a hard time finding someone to fill it."

Hyde attributes that difficulty in part to the job market — IT jobs are numerous and talent is scarce in his part of the state. But he also points out that the new job requires someone with a particular kind of personality. He's holding out for a person who

SKILLS IN DEMAND

What types of IT skills do you expect your organization to hire for in the next 12 months?

Skill	%
Application development	49%
Help desk/IT support	37%
Security	29%
Network administration	28%
Business intelligence	24%
Networking	24%
Database analysis and development	23%
Cloud computing	21%
Web design/development	20%
Data management	19%
Mobile/wireless	18%
Data mining/data warehousing	17%
Enterprise application integration	17%
Virtualization	15%
Software-as-a-service (SaaS)	15%

BASE: 623 MANAGERS EXPECTING TO INCREASE IT HEADCOUNT IN THE NEXT 12 MONTHS; MULTIPLE RESPONSES ALLOWED

has a blend of tech skills and business process re-engineering capabilities.

For the right person, this midlevel job has great growth potential, he notes — and not just within the confines of traditional IT. "The job in and of itself is IT-based, but it uses and cultivates skills that could lead to a job in operations or other non-IT areas," says Hyde.

Technology Solutions Engineer

Erik Cummings, director of IT at NetSuite in San Mateo, Calif., is so hot on the new job title he's introduced — technology solutions engineer — that he's in the process of transitioning two existing employees into the slot and hiring a third from the outside.

Why the push? "We need people who think business solutions, not just problem-solving," Cummings says. "We need IT to be the kind of organization that, if you're on the business side, we know your problem before you know it."

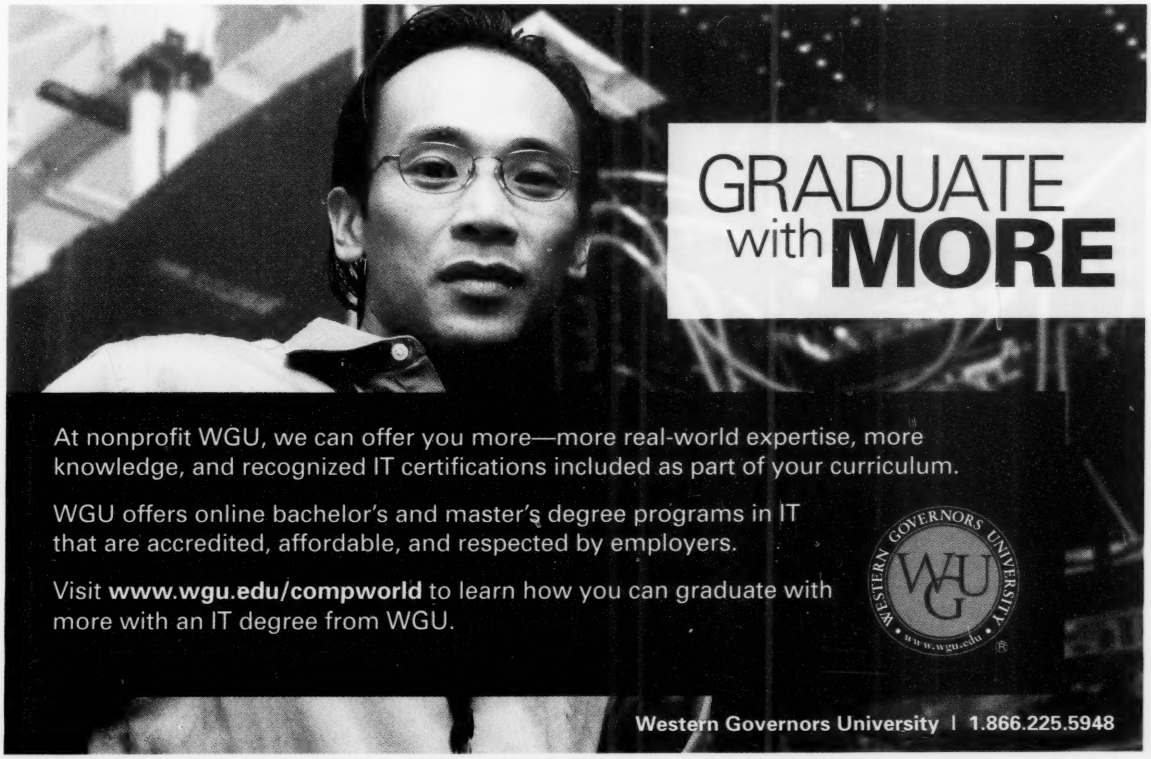
Cummings says that there's no question in his mind that technology solutions engineers are a unique breed. Their characteristic trait boils down to one thing: flexible thinking. "These people are not only the Swiss Army knives of IT, with a breadth of experience in various applications," he explains. "They can sit down and show me that they understand what a business problem consists of and [produce] a bunch of creative ways to solve it."

The kind of people who do well in this job are those that feel a personal investment in the success of the organization: "They have an unwavering tenacity to get it right for the business," he says.

The new hybrid IT job titles are a reflection of the larger shift that's taking place across the tech sector.

"Six to 10 years ago, people looked to hire subject-matter experts," Cummings says. "Now the smartest thing someone in this field can do is to multitrack their career. Above all, realize that IT isn't just a service organization anymore." ◆

Wilkinson, *a Lexington, Va., writer, is the former publisher of* Brain, Child Magazine.



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OPINION

ALICE HILL

It's Time to Catch Your Own Wave, People!

Getting someone to quit a job often requires changing his heart more than changing his salary.

IF YOU TRULY want to understand the chaotic nature of America's economic recovery, especially in the tech sector, think hard about three words: Quitting. Confidence. Fear.

Quitting is the biggie, because it's a window into why, for many of us, the Great Recovery continues to gnaw at our guts late at night. By virtually any measure — the unemployment rate, the Nasdaq Composite Index and other economic indicators — the recovery in tech since the "official" end of the recession in June 2009 should be cause for celebration. The fourth-quarter 2012 tech unemployment rate was 3.3%, compared to 7.8% in the overall economy. Job creation is surging: Far more IT jobs have been added in the 45 months since the recession's end than at the same points in the 1991 and 2001 recoveries.

The problem? Experienced IT professionals aren't quitting their current gigs to take the new jobs. The Bureau of Labor Statistics tracks "quits" among people working in professional fields and business services. In 2007, leading up to the recession, about 5.7 million professionals — 32% of the professional and business services workforce — voluntarily left jobs. In 2012, three years post-recession, we saw about a 26% quit rate among the same workers.

Why are so many people staying put? The answer doesn't seem to be a lack of confidence.

My company, the online tech careers service Dice.com, asked more than 15,000 IT pros about their career plans for 2013. Four in 10 told us that they plan to change jobs in the year ahead. And 64% expressed confidence about their chances of landing a favorable position this year.

Read those numbers together and you see that a tremendous number of tech workers want to quit, and most believe they can advance their careers by doing so. So, why don't they quit?

My answer, in a word: Fear.

Anyone who has ever tried to coax a child into a swimming pool has seen confidence and fear do battle. There's big talk and swagger, a shallow end that looks inviting — until the brave risk-taker reaches the water's edge. That's when what seemed like a great idea gives way to weak knees.

The tech recovery circa 2013 appears to have put people in that same conflicted mindspace. That means trouble not only for employers who want to hire the best so they can innovate their way to growth, but for an economy that requires worker movement to add to GDP.

What's the answer for a workforce where nearly half the talent pool wants to quit, but only a quarter do? One school of thought is money: 67% of Dice survey respondents said the search for higher compensation was driving their decision to change jobs. And more than half of the *Computerworld* Salary Survey respondents who said they're looking for new jobs cited a desire for higher pay.

I think overcoming fear requires more than cash and perks. "Soft" motivators — challenging assignments, flexible schedules, recognition from management, telecommuting options — also resonate, particularly among those who are less experienced. Money isn't irrelevant, but getting someone to quit a job often requires changing his heart more than changing his salary.

In an economic recovery where the whiff of fear lingers, the employers and hiring managers who get the best people will be the savvy few who learn to create confidence in the many. ◆

Alice Hill is president of Dice Labs and managing director at Dice.com. You can follow her on Twitter (@DiceTechJobs).

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Career Watch

Q&A

Norm Matloff

A longtime critic of the H-1B visa program, the University of California, Davis, computer science professor talks about **immigration issues.**

***Computerworld* recently took a look at H-1B visa usage and determined that offshore outsourcers are the largest users. What do you make of that finding?** Frankly, this is a red herring. *Computerworld*'s data confirms that most H-1Bs are *not* employed by the offshoring firms, and in any case, offshoring is an irrelevant issue. An American worker doesn't care whether a job has been shipped overseas or filled by an H-1B here – either way, that job is not available to this American worker! It's a phony issue.

By the way, the data in my forthcoming paper shows that abuse of H-1B extends throughout the industry, absolutely including the mainstream, household-name firms. [A preliminary version of the paper is available online.] Thus, claims that the main abusers are the Indian offshoring firms amounts to unwarranted scapegoating, maybe even with racial overtones.

H-1B proponents say they can't find the people they need in the U.S. Is there data that supports or refutes that claim? The data is abundantly clear, refuting the claim: Wages in the computer fields are rising at only about 1% to 3% yearly. If there were a labor shortage, salaries would be rising sharply. When we had a gasoline shortage in California last year, prices were up 30% or 40%.

The extensive Urban Institute study of 2007 showed we are producing far more people with STEM degrees than we need. And in a rare moment of candor, a Texas Instruments executive stated in House testimony in 2011 that our educational system is producing plenty of American engineers.

If immigration reform happens this year, what changes would you want to see in policies that affect IT workers? I support the AFL-CIO proposal that the legal prevailing wage for H-1Bs – I would add green cards to this – be defined to be the 75th percentile in the given occupation and geographic region. The industry claims it's hiring people with rare skills, so they should pay a premium. Also, I would give "instant green cards" to any foreign STEM grad with a legitimate job offer at the 90th percentile or higher, as they are arguably "the best and the brightest."

The Gender Gap: Is IT a Model?

Though women continue to be underrepresented in the IT workforce (according to the Bureau of Labor Statistics, women held 57% of professional positions in the U.S. in 2011, but they held only 25% of computing positions), the pay gap between the sexes has been closed in IT, according to the Dice Salary Survey.

The survey found that the average annual income for women in IT in 2012 was just over $87,500, compared with nearly $96,000 for men. That doesn't sound equitable, but Dice says men and women tend to hold different positions in the IT workforce, and when you compare equal levels of experience and education and parallel job titles, the difference melts away. **That point is borne out by Dice's findings on the top five tech positions held by members of the two sexes.**

	WOMEN	MEN
1	Project manager	Software engineer
2	Business analyst	Systems administrator
3	Other IT	Project manager
4	QA tester	IT management
5	Technical recruiter	Application developer

Dice is careful to note that it cannot be determined from the results of its survey whether women and men gravitate to different jobs by choice or whether they are steered by institutional bias. But the online tech careers service did take a closer look at the results when it became apparent that **women's average salaries increased by a bit over $2,000 from 2011 to 2012 while men's rose by over $5,000**. Dice's statisticians concluded that that large differential was also position-driven: Positions more frequently held by men (such as IT management and engineer) had higher raises than those more frequently held by women (such as business analysts and project managers).

Average Salary by Sex

2011	2012	2011	2012
$85,484	$87,527	$90,771	$95,929

And the survey also found that women in IT were slightly more satisfied with their compensation than men:

	Women	Men
Very or somewhat satisfied	58%	56%

SOURCE: DICE SALARY SURVEY OF 15,049 EMPLOYED TECHNOLOGY PROFESSIONALS, FALL 2012

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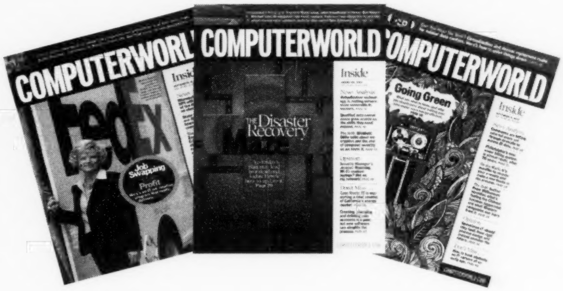

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SHARKTANK

TRUE TALES OF IT LIFE AS TOLD TO SHARKY

HAL MAYFORTH

[redacted]

Let There Be . . . Dark

At this government agency, a hearing officer does remote video hearings for appeals of application denials. "Someone at the remote office turns on a monitor that has a built-in camera and leaves the room," explains a sysadmin pilot fish in the loop. Later, the claimant comes in and the hearing commences. The hearing officer reported to IT that the monitor in one office kept going into sleep mode and he couldn't wake it up. I called the remote office and asked if they had different settings on their PC. 'No,' the admin said. 'We just have an energy-saving motion sensor that turns off the office lights if no one's in the room for more than five minutes.' "

Yes, That Might Help

This developer pilot fish is responsible for an application that has been in use for years with few problems. "I get a support ticket that says a remote user can't launch the application," says fish. "The logs all look clean. As far as I can tell, the user should be staring at the first dialog screen, but it's nowhere to be found. There's much back and forth via email, and I suggest everything I can think of as I try to wrap my head around why this one user is having a problem that shouldn't be happening and that nobody else has ever seen. We finally schedule a screen-sharing session, so I can try to see the problem for myself. I poke around on the user's system, but I still have no idea what's wrong. Finally the user asks me in passing, 'Should I turn on my other monitor?' "

Because What Could Possibly Go Wrong?

It's the 1980s, and the military telecommunications center that supports a national intelligence agency is getting its first major upgrade in a decade. "After running it on an 'identical' system elsewhere, it was time to upgrade our live systems," says a pilot fish on the team. "On upgrade day, we brought the backup system down, installed the update and started bringing it up as the active system." And while the new system is coming up, fish starts bringing the original system back up to its final start prompt. What the @#$%! are you doing? someone asks. Fish explains that he's preparing to switch back if there's a problem, but the observers scoff at that idea. The upgraded system comes up, receives its first message – and crashes. Fish answers the final prompt on the other system. Two minutes later, the site is back up, receiving traffic on the old version. "We were required by regulation to formally report on outages of 10 minutes or longer," says fish. "We were offline less than nine minutes."

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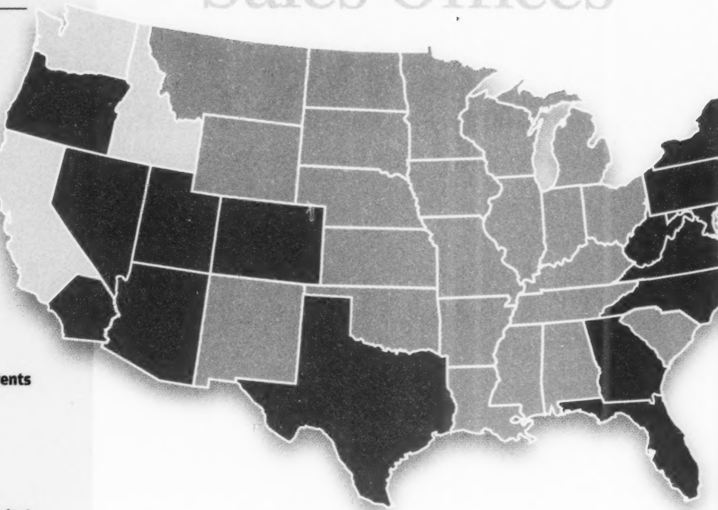

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OPINION

THORNTON A. MAY

Is the Future Knowable?

CAN WE KNOW THE FUTURE? IT practitioners, like others who work for a living, tend to view future-peering as an esoteric, abstract and impractical exercise practiced only by eggheads in think tanks, economists in Europe and lotus-eating guitar pluckers.

> If you are going to find the future, you have to know where to look for it.

But the future is where we are all going to live, and those who have some idea of what that place will be like will be better positioned to live there comfortably. As Al Ries, a real-world marketing professional, author of the book *Positioning* (and coiner of that term), has said, "The primary job of corporate management is to find the future. Not just the future in general, but specific futures for the corporations under their care."

I believe that knowing the future, or at least preparing for a shared perception of what the future requires, is a big part of the new IT skill set. Many CIOs agree with me. One says that a critical element in his decisions to promote his direct reports is the way they respond to his request to "Describe a day in the work life of your future."

Of late I have been asking executives this: "If your boss came to you next Monday and said, 'By Friday, please have on my desk a report regarding what our organization will look like 20 years from now and your thoughts on how we get there,' what would you do?"

Younger executives (those who are the children of the Internet but not yet the spawn of the smartphone) tend to suggest that you type into your favorite search engine some variant of "Future 2033." This exercise is not exactly clarifying. Using Bing, that query yields 273,000 results. With Google, the haul hits 10.2 million. (And remember, in search, bigger is not always better). A large proportion of first-page search returns point you to Mexican director Francisco Laresgoiti's speculative, dystopic sci-fi thriller *2033: Future Apocalypse*. The next set of suggestions are a trailer for the video game Metro 2033; BarnesandNoble.com's early release of *2033: The Future of Misbehaving*, an anthology examining the future of sex; and the article "Top 30: Things to Look Forward to in 2033," sponsored by SVEDKA Vodka. Going deeper, you might click on a link to an April 3, 1988, *Los Angeles Times Magazine* article offering a 25-year look ahead to 2013. While all of these entries are interesting, they don't help us comply with our boss's request.

Where Do You Find the Future?

Baby boomers may look at these results and be comforted to find that the Web does not hold the answers to all questions. But traditional business media don't offer much more help. Most business publications don't treat the future effectively — if they cover it at all. If you read Walt Mossberg in *The Wall Street Journal* or David Pogue in *The New York Times*, you might believe that the future is all about technology devices. *No, no, no!* The future is about what we *do* with devices — not the devices themselves. These writers feed executives' gadget obsession, a disease that trivializes the true value that technology can deliver to enterprises, individuals and society at large.

No, if you are going to find the future, you have to know where to look for it.

Like Dorothy Gale, you should look in your own backyard. You are not going to be the only person in the future. Start having conversations with the smartest and highest-energy people you know regarding what they think about the future. I'm confident you will get a clearer picture than the *Los Angeles Times Magazine* presented about our present back in 1988. ◆

Thornton A. May is author of *The New Know: Innovation Powered by Analytics* and executive director of the IT Leadership Academy at Florida State College in Jacksonville. You can contact him at thorntonamay@aol.com or follow him on Twitter (@deanitla).

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